LIBRARY
STATE PLANT BOARD

UNITED STATES

DEPARTMENT OF AGRICULTURE

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
NEWS LETTER

VOLUME III

#6

Digitized by the Internet Archive
in 2016

https://archive.org/details/newsletter3619wash

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR APRIL 1936

Vol. III, No. 6 (Not for publication) June 1, 1936

FRUIT INSECT INVESTIGATIONS

Methods for breeding Aenoplex carpocapsae Cush.--Earl Lott, of the Moorestown, N. J., laboratory, reports progress in the development of methods for rearing A. carpocapsae, an indigenous parasite of the codling moth. This species is apparently absent as a parasite of the codling moth in some sections. It has been determined that the adults attack prepupae in the cocoons, piercing the silken wall of the cocoon to paralyze the host, and to lay from one to several unattached eggs beside its body. The larvae are not notably cannibalistic, but usually only one matures on each host. All feeding is external, the larvae moving freely about within the cocoon during their whole developmental period and cocooning beside the remains of the host when mature. After mating, the ovipositing females are confined in small cages having a gauze floor. These cages are placed over codling moth cocoons from which excess paper has been torn on the face exposed to the gauze. Each day the exposed cocoons are removed, opened, and all parasite eggs are shaken into petri plates. Additional host prepupae are removed from their cocoons and artificially paralyzed by immersion in hot water at exactly 54° C. for 5 minutes. These are then distributed in small salve boxes 1-1/2 inches in diameter, about 30 host prepupae being required to cover the bottom of the container. The eggs are then distributed over the paralyzed larvae at the rate of one to each host. Hatching and development proceeds in this container in a satisfactory manner, an average of about one parasite maturing from each two eggs used.

Petroleum oils more effective than vegetable oils in scale control.--A. W. Cressman, Wooster, Ohio, has found that highly refined petroleum oil is much more effective against the eggs of certain scale insects than are various vegetable oils. The test insect used in this particular series of experiments was a species of Chionaspis on willow. The same series of experiments gave information on the relation between the proportion of fatty acid present, the drying properties of the oils (as measured by the iodine number), and their effectiveness. The results of these experiments were as follows:

LIBRARY
STATE PLANT BOARD

Oil used (4 percent strength throughout)	Acid value (cc. N. NaOH per 100 grams of oil)	Iodine number (Percent by weight of iodine absorbed)	Scale with all eggs and crawlers dead
			Percent
None	--	--	2.0
Petroleum (highly refined)	0.28	1.6	73.1
Peanut	3.52	85.0	51.3
Refined cottonseed and fatty acid	3.52	111.3	25.2
Refined cottonseed	0.22	111.5	9.6
Crude corn	7.63	125.9	19.7
Refined corn	0.10	123.8	3.7

Certain tentative conclusions can be drawn from these data. Petroleum oil was definitely more effective than any of the vegetable oils. Differences are much greater when dealing with the eggs of this armored scale than in treatments of mealybugs, where the oil comes into immediate contact with the insect's body. There was a marked correlation between the drying properties of the oils and their effectiveness. These differences continued as the crawlers began to emerge from beneath the scale covering. Nearly all of those emerging were killed by the residues of peanut oil or petroleum oil on the twigs, whereas appreciable numbers were able to settle on the twigs sprayed with corn or cottonseed oil. Apparently the latter two oils had hardened sufficiently to permit the young larvae of the scale insects to crawl on the surface without taking up any of the oil. The presence of fatty acids also appeared to increase the effectiveness of the vegetable oils.

Notes on life history of Microbracon hebetor Say.--H. C. Donohoe, of the dried-fruit insect laboratory at Fresno, Calif., reports on the results of experiments with this parasite wherein the females were provided with a surplus of full-grown larvae of the raisin moth (Ephestia figulilella Greg.). At a constant temperature of about 90° F. (10 records), more than 300 larvae were paralyzed by 1 female during her life. At about 80° (5 records) 625 were paralyzed. Stinging of larvae continued after the insects had lost their ability to reproduce, but the number paralyzed per day (about 25 in early life) declined as the age of the parasites increased. In the case of 5 females held at 80°, of which the offspring totaled 1,100, the proportion of male progeny increased with the age of the parents; all progeny (201) from eggs laid after the 15th day of the life of the parents were males. At 80°, 4 females produced an average of 248 offspring, the maximum being 401. About 14 percent of 837 paralyzed larvae, held at 90°, recovered partially or completely. Pupation and emergence of recovered larvae was recorded. Recovery among paralyzed larvae (589) at 80° amounted to 17.5 percent. There was evidence that the proportion of larvae that recovered increased with the age of the parasites at the time stinging occurred. At 90° the egg-to-adult period most frequently observed was 9 days. At 80° the period averaged 12 days. Adults reared in a temperature of 90° were pale brownish yellow while those at 80° were from dark brown to black. Others from the same stock, reared in a room where temperatures ranged from about 50° to 80°, were glossy black.

Winter killing of Japanese beetle larvae.--I. M. Hawley and T. N. Dobbins, Moorestown, N. J., report that additional surveys made during the early part of April bore out the previous statement that mortalities of larvae during the winter just passed have been high, frequently running above 50 percent, in areas in New Jersey south of the latitude of Trenton, in the southeastern portion of Pennsylvania below Philadelphia, in northern Delaware, and in northeastern Maryland; in areas where there was a heavy snow cover on the ground the mortalities were usually less than 5 percent, these conditions obtaining in the northern half of New Jersey and in Pennsylvania north and west of Philadelphia. A study of the situation indicates that these high mortalities were not due solely to the lowering of the soil temperature. A study of weather conditions during the cold periods in 1934 in comparison with those of 1936 showed that both air and soil temperatures were lower in 1934 than in 1936, and that the cold period was equally long in both seasons. The main difference in the two seasons was in the form and amount of precipitation prior to and during the cold spells. In 1934 there was only 0.66 inch of rain in the 24 days prior to the advent of low temperatures, while in 1936 there was 5 inches of rain in the 16 days prior to the first cold day. Moreover, in 1936 the cold period was ushered in by a rainstorm that turned to sleet and produced an ice coat on the ground in many areas where high mortalities have occurred, whereas in 1934 there was no precipitation during the first 3 days of cold weather, after which there was snow. In 1936, therefore, the soil was thoroughly water saturated, and as the temperature fell the soil was frozen solid. It appears that, as the ice in the ground was cooled below the freezing point during this season, the pressure produced was largely responsible for killing many of the larvae. It also seems probable that in the saturated soil there was much free water in the bodies of the hibernating larvae, and as this expanded the body tissues were ruptured. Larvae in such a moist environment are apparently less cold hardy. The study also suggests that in determining the conditions that bring about a substantial mortality of the larval population, the degree of saturation of the soil is a factor of equal importance to the factor of actual temperature.

Resistance to drying of spores of types A and B of the milky disease of Japanese beetle larvae.--S. R. Dutky, Moorestown, tested during April 1936 blood films containing spores of types A and B of the milky disease dried on glass slides since July 1935 to determine their ability to produce the disease upon injection into healthy larvae. He found that the time of development of the disease was approximately the same as for fresh blood suspensions of the spores. Spore counts on the blood of injected larvae at intervals of 1, 2, 3, 4, and 5 days indicated that over 75 percent of the injected spores had germinated by the fourth day.

Derris as a repellent for Japanese beetles.--W. E. Fleming and R. D. Chisholm, Moorestown, prepared a series of derris compounds containing rosin and white pigments to determine the effect of these materials on the adhesion of derris deposits and the effect of sunlight on these deposits. Of the several pigments tested, the best protection was shown with zinc oxide, titanium pigment (barium base), and titanium pigment (calcium base), each of these materials showing over 50 percent of the initial deposit still active after the exposure period, the greatest initial deposit being obtained with zinc oxide. Derris compounds containing 10 percent of rosin and 2 percent of phenol and other organic compounds were tested to determine their resistance to decomposition on exposure to light. The best protection resulted from the use of phenol, aniline, and quinine, there being in each case 50 percent undecomposed on exposure to light.

MEXICAN FRUIT FLY CONTROL

Mexican fruit fly in lower Rio Grande Valley.--Within the past month, 23 *Anastrepha ludens* Loew were trapped by inspectors in Texas. Fifteen of these specimens were taken in the valley before April 15. During the same period 7 other specimens were trapped in the brush north of the valley. Only 1 adult was trapped after the middle of April. This specimen was taken at Premont in Jim Wells County. The host-free period for the lower Rio Grande Valley went into effect April 1. Before the end of the month all the groves had been checked for ripe fruit remaining on the trees. Practically all fruit found was cut and examined for larval infestation before burial. No larvae were found. Two thousand new glass traps were received recently. Four hundred were sent to Mexico and the remainder were put in operation in Texas.

DATE SCALE CONTROL

No scale found.--Scouting was completed in the Coachella Valley, Calif., during the month. Fan-palm inspection was continued, 454 palms being inspected in April. Most of the infested area has been covered and no scale found. The final inspection of the Reed Garden in the Imperial Valley was made and no scale found. No scale has been found in this garden since February 1934 and none in the Imperial Valley outside this garden since April 1933.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Winter mortality of European corn borer.--A. M. Vance, of the Toledo, Ohio, laboratory, reports that no evidence of a pronounced lethal effect on corn borer larvae from the low temperatures of the past winter has appeared in any localities where observations have been made. On the contrary, a lower mortality rate is indicated than that found in March 1934. D. W. Jones found no winter mortality on the Eastern Shore of Virginia up to March 9. Since that date mortalities as high as 4 percent have been noted in some of the more heavily infested fields.

Late fall seeding of annual legumes avoids early spring aphid infestation.--L. P. Rockwood and Max M. Reeher, of the Forest Grove, Oreg., laboratory, report that on plots of vetches and peas seeded on September 16 and on October 1, 22, and 30, 1935, and on March 20, 1936, Illinoia pisi Kalt. were present in the same numbers on April 2 as they had been on March 2, on the September 16 and October 1 plots. There were more on the common vetch plots than on the plots of Austrian winter field peas, which indicates a better winter survival on common vetch. By April 16, during the period of abnormally warm weather without precipitation, they had begun to increase rapidly, especially so on the Austrian pea plots, but no alates had yet invaded plots seeded on October 22 and later. Alates were being produced on the September 16 plots at that time but none were produced on the October 1 plots until after April 28. The October 22, October 30, and March 20 plots were invaded for the first time by immigrant alates on April 29 and 30. Therefore fall-sown vetches and peas seeded on October 22 (and probably on October 15) or later would have remained free of aphid infestation up to about April 29, or later, if at a distance from earlier sown annual legumes. Moreover, the September-sown plots were the sources of the earliest spring migrant alates.

Pea aphid in Kansas.--E. T. Jones, Manhattan, Kans., reports that no I. pisi have been found in alfalfa fields in counties in the vicinity of Manhattan, either last fall or this spring. Owing to conditions adverse to their development, it has been difficult for the aphids to build up, even in the most favorable situations in greenhouses and hotbeds, populations sufficient to effectively test alfalfa selections for aphid resistance. Of 200 aphid-resistant selections from about 40 varieties of alfalfa, in a hotbed test, only 10 were found to be aphid-free at the end of 3 months' exposure to infestation. Reinfestation has shown only 4 of these strains to be aphid-free at the end of 3 weeks' exposure. The 4 aphid-free selections were from Grimm, Kansas 308, and 2 strains of Turkestan.

Parasites of Trachelus tabidus Fab.--C. C. Hill, of the Carlisle, Pa., laboratory, reports that three male specimens of Microbracon terebella (Wesm.) were reared from the black grain-stem sawfly (T. tabidus) by E. J. Udine, who collected the material at Adamsville, Crawford County, Pa. According to C. F. W. Muesebeck, who determined two of the specimens, this is the first record of the occurrence of this parasite in the United States. In England it is an important parasite of wheat sawflies. This spring 94 Trichacis remulus Walk. were released by J. S. Pinckney at Salisbury, N. C., and 48 at Gretna, Va., in connection with biological control work on the hessian fly. These parasites were shipped from France by H. L. Parker.

Fly-resistant spring wheats.--E. T. Jones, of the Manhattan laboratory, reports that in tests at Parsons, Kans., a number of spring wheats have shown outstanding resistance to the development of a heavy natural infestation of hessian fly larvae of the second spring brood. Examination of representative samples from about 400 test rows has recently been completed. The data obtained show that 23 percent of 371 strains in the test had a tiller infestation of less than 17.5 percent (average for the Marquillo selection resistant checks). This group of resistant selections consisted of 61 strains of

Triticum vulgare, 7 additional Marquillo selections, and 17 strains of other species of *Triticum*. The average infestation for the susceptible checks (*Ceres*) was 56.9 percent. Included among selections with from none to very light infestations are Livingstonia, Illinois No. 1 W 19, Durum C.I. No. 3210, a white selection of Bobs, Quality, Durum C.I. 4131, Marvel, Polish, Illinois No. 1 B 38, Supreme, Mangan, and several other strains of common and Durum wheats.

JAPANESE BEETLE CONTROL

Lead arsenate applied by convict labor at Greenville, S. C.--In cooperation with officials of the South Carolina State Crop Pest Commission, three employees of the project, working from April 22 to May 5, applied 8 tons of arsenate of lead to 16 acres in and surrounding the sections of Greenville, where 89 beetles were caught in 799 traps during the past season. Sixty-nine beetles were caught in a single yard, and all but 3 of the remainder in the same or the four adjacent blocks. Two beetles were trapped in a section two blocks away, and 1 beetle about a mile away. Each infested section is in close proximity to a railroad. An appropriation of $1,600 from the State contingent fund was made available for the purchase of material. Two high-pressure sprayer trucks were driven to Greenville from the project's warehouse at New Cumberland, Pa. The Greenville soil treatment was unique in several respects. The 16 laborers assigned by the State to assist the Federal employees were convicts under guard. In addition, this was the first time that an injunction had been obtained to prevent the application of lead arsenate to private property. A local physician obtained an injunction in the court of common pleas to prevent the crew from going upon his property to treat the soil. The plaintiff alleged that the substance used was poisonous and would "constitute a menace to their health and the safe and free enjoyment of said premises." Dr. F. E. Kitchen, chairman of the agricultural committee of the Greenville Chamber of Commerce, and Franklin Sherman of Clemson College, induced the physician to withdraw the injunction. One of the Greenville newspapers referred to the proceedings as the "first anti-anti-Japanese beetle injunction."

No Michigan State Japanese beetle quarantine this spring.--Following a public hearing held in Detroit, Mich., on April 23 to discuss the advisability of placing an intrastate Japanese beetle quarantine on the infested sections of Detroit, James F. Thomson, Commissioner of the Michigan State Department of Agriculture, announced that he is of the opinion that no quarantine should be placed upon the Detroit district for the present season. The Bureau was represented at the hearing by C. W. Stockwell and T. C. Cronin. The Michigan authorities desire to proceed with the treatment arrangements already made by the Parks and Boulevards Department of the City of Detroit, and to intensively trap throughout the city during the coming year to determine whether or not the soil poison to be applied to a limited portion of the city will suppress the infestation found there last year.

Lead arsenate treatments in Detroit follow completion of Erie, Pa., work.--Light snowfalls and rain on April 18 and 21 interrupted soil treatments applied in Erie, Pa., from April 13 to 24. Two Federally owned tank sprayers were provided to apply the State-purchased arsenate of lead. Hosemen and other laborers were also provided by the Pennsylvania Department of Agriculture. Four tons of lead arsenate were sprayed on 8 acres of ground in sections of Erie outside previously poisoned areas where Japanese beetles were trapped last year. At the conclusion of the Erie treatments, the sprayer trucks were driven to Detroit, Mich., where similar operations were begun on April 30.

Glassless, screened greenhouse replaces beetle-proof enclosure.--Rather than replace a large beetle-proof, screened hydrangea cage which collapsed under the weight of snow and sleet during the severe winter, a classified nurseryman in the Philadelphia suburban area has removed all glass from a 30 by 150 foot certified greenhouse and has screened this in the same manner as the outdoor cage. The glass will be replaced in the fall.

Soil conservation plants certified.--Inspectors from the New Cumberland, Pa., station have inspected and certified nearly a million plants and trees for the local Soil Conservation Service. Wild honeysuckle and coral berry are being gathered in quantities in that area and forwarded to several C. C. C. camps in Pennsylvania and in the Southern States for planting as soil-anchoring plants.

Hundreds of gypsy moth egg clusters found on scrap iron.--Inspection of two carloads of old car rails and a carload of scrap iron known to contain gypsy moth infestation resulted in the location and destruction of 269 egg clusters in the two carloads of rails inspected at Milford, N. H., for shipment to Butler, Pa. A single rail in this lot yielded 37 egg masses. Inspection at Laconia, N. H., of a carload of scrap iron consigned to Johnstown, Pa., disclosed 15 egg clusters that would have traveled to western Pennsylvania had not the inspector found and destroyed them.

Dutch elm disease activities.--Elm foliage began to appear by the end of April. Foliage buds had burst on some trees in the vicinity of White Plains, N. Y., as early as April 20 and leaves had slightly unfurled by the end of the month. Drastic reductions were made in the W. P. A. force at the end of the month to change from a winter-sanitation to a summer-scouting basis. Most of the men retained will be trained in scout schools to be held the middle of May. In the meantime they will devote most of their time to burning accumulations of elm material taken out during the sanitation campaign, and to scouting the coast line of Long Island and the banks of New Jersey rivers to search for elm driftwood that might have been washed down from infected and noninfected sections during the recent high-water stages.

Sanitation work at outlying infections.--Sanitation work in Putnam County, N. Y., will be centered about three outlying *Graphium* infections. The centers of work will be an area surrounding the infection north of Peekskill, another surrounding the Lake Mahopac infection, and a third about the Brewster infection. Some of this work will extend beyond the known infection zone. At the same time it is planned to complete the area between these disease centers, thus clearing up the entire infected zone.

Fire hazard increases.--Burning of elm material is becoming more hazardous as the spring season advances. Extra precautions are being taken by eradication crews to avoid fire damage. In some areas the no-smoking rule has again been applied.

Field headquarters transferred from White Plains, N. Y., to Bloomfield, N. J.--Effective April 6, the field headquarters supervising Dutch elm disease, corn borer certification, and Japanese beetle and gypsy moth quarantine enforcement was transferred from the ninth floor of the Westchester County Office Building, White Plains, N. Y., to a three-story brick building at Glenwood Avenue and Henry Street, Bloomfield, N. J. When full occupancy of the new field headquarters is obtained the garage housing Dutch elm disease equipment will be moved over from West Orange, N. J. Space has been provided for the New Jersey leader of Dutch elm disease activities, and for the State cooperating personnel.

FOREST INSECT INVESTIGATIONS

Damage to shelterbelt trees by army cutworms in Kansas reduced.--Late in March and early in April 1935, heavy losses of newly planted trees occurred near Pratt, Kans., as a result of root girdling by the army cutworm (Chorizagrotis auxiliaris Grote). A survey of these areas of infestation made during the last week of March 1936 by H. H. Walkden, of the Division of Cereal and Forage Insect Investigations and J. A. Beal and N. D. Wygant, of this Division, indicated that the damage to the trees this spring would be much lighter. Very few cutworms were present in their natural habitat, under cow chips in pastures. Only a few could be found on the strips where trees were planted and in no case were they damaging the trees. Where they occurred on the strips they were found feeding on volunteer wheat and other weeds and they appeared to prefer these to the trees. With delayed cultivation, leaving this wheat and other green vegetation on the strips until cutworm feeding was over (about April 15 in Kansas), no serious damage to the trees this year was anticipated. The fact that no cutworm damage has been subsequently reported from these areas during April substantiates the findings of the survey.

Balsam bark beetle in Rocky Mountain region.--J. A. Beal, of the Fort Collins, Colo., laboratory, reports that the work of the balsam bark beetle (Dryocoetes confusus Sw.) in alpine fir has been especially heavy during the past year. Numerous requests for information on insects killing alpine fir in the Rocky Mountain region have been received and examination of the trees or of the insects responsible for their death has invariably shown the balsam barkbeetle to be involved. In southern Colorado, in alpine fir stands of the Uncompahgre and Montezuma National Forests, large groups of red-tops from a distance resemble a mountain pine beetle outbreak in a lodgepole pine stand. Other southern Colorado forests on which similar losses have been heavy in alpine fir are the San Juan, San Isabel, and the Rio Grande. Similar losses have been reported from some of the National forests in Utah. The low value of the fir has thus far prevented any attempt at control of this insect.

Bark beetles breed in diseased trees.--C. W. Collins reports that records obtained by the Morristown, N. J., laboratory show that the smaller European elm bark beetle (*Scolytus multistriatus* Marsh.) and the native elm bark beetle (*Hylurgopinus rufipes* (Eichh.)) breed in elm trees attacked by the so-called "Cephalosporium die-back." The fungus was cultured from trees by the Division of Forest Pathology, Bureau of Plant Industry. Cephalosporium die-back of elm is common and the symptoms closely resemble those of the Dutch elm disease, caused by *Ceratostomella ulmi* (Schwarz) Buisman. Where both fungi are present in the same tree it is sometimes difficult to culture them both from samples taken from the tree. For this reason it is possible that *C. ulmi* might have also been present in some of the trees in which the bark beetles were found to have bred. The observations made do, however, indicate the possibility of beetles issuing from trees affected by the Dutch elm disease carrying *C. ulmi* to trees weakened by Cephalosporium die-back.

Notes on European spruce sawfly.--H. J. MacAloney, of the New Haven, Conn., laboratory, reports on the European spruce sawfly as follows: "At Tupper Lake, N. Y., an examination in April of several foot-square samples of litter showed a population of slightly less than 1 live cocoon per square foot. At Orange, Conn., 28 unopened cocoons were collected from the litter under 10 trees on April 28. Of these, 23 were alive and 6 contained pupae, one of which was nearly in the adult stage. One of the remaining 5 had been parasitized by a small chalcid. The average cocoon population at Orange is also less than 1 per square foot, although in 2 of the samples there were 3 and 4, respectively. Cocoons collected the same day by G. A. Plumb, of the Connecticut Agricultural Experiment Station, were placed in the constant-temperature room that afternoon. An adult emerged on April 30."

Fluctuation in numbers of larch case bearer.--J. V. Schaffner, Jr., of the New Haven, Conn., laboratory, presents the following table giving information on the fluctuation of population of the larch case bearer (*Coleophora laricella* Hbn.) during the last 4 years at nine permanent sample plots in New England:

Locality	Number of larvae per lineal foot of twig				Dissections in 1936		Empty cases
	1933	1934	1935	1936	Living	Dead	
Connecticut:							
Woodstock	14	19	14	7	47	37	16
Maine:							
Corinth	47	29	86	5	22	28	50
Sydney	83	20	83	22	11	69	20
Massachusetts:							
Lunenburg	11	8	15	3	70	21	9
North Andover	29	24	17	7	37	60	3
New Hampshire:							
Berlin	35	17	28	11	52	33	15
New York:							
Greenfield	14	10	25	13	50	44	6
Saranac	6	40	45	31	70	29	1
Vermont:							
Sharon	15	48	34	29	57	40	3

Based on these counts, the infestations have decreased in every plot and the fall and winter mortality was unusually high.

Parasites of Neodiprion tsugae Middleton.--P. B. Dowden and P. A. Berry, of the New Haven, Conn., laboratory, report: "Spring emergence of parasites from N. tsugae cocoons collected at Sweet Home, Oreg., last fall has been rather encouraging. A colony of 348 females and 65 males of Itoplectis montanae Cush. was obtained from this material, and liberated in an infestation of Diprion polytomum Htg. at Tupper Lake, N. Y., on April 23. Another ichneumonid (undetermined) has been obtained in fairly good numbers. So far about 200 males and 8 females have issued. D. polytomum cocoons will be subjected to this species also."

Experimental spraying from an autogiro.--S. F. Potts, New Haven, reports that a 5-acre red pine plantation located near Providence, R. I., was sprayed from an autogiro with a concentrated lead arsenate-linseed oil-water mixture (one part arsenical to two parts of liquid by weight). This spray is about 100 times as concentrated as mixtures used in ground spraying and approximately 8 gallons were used per acre. The spray was released from the autogiro at the rate of 40 gallons per minute in a swath 50 feet wide. Observations on this test indicate that the autogiro may be effectively used in forest insect control work, but this must be confirmed by large-scale field experiments before definite conclusions can be drawn. To our knowledge, this is the first test of an autogiro in applying sprays to a forest, although no insects were present for this particular test. It is believed also to be the first time a liquid spray has been released from the air over a woodland.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Labor and accomplishments.--Up to March 28, 1936, under the W. P. A. projects, the following numbers of workers were employed under the gypsy moth projects, in the different States: Maine, 803; New Hampshire, 183; Vermont, 937; Massachusetts, 803; Rhode Island, 109; Connecticut, 790; New York, 243; New Jersey, 135; Pennsylvania, 1,146; total, 5,149. On the same date, under the W. P. A. emergency project, the numbers employed on brown-tail moth work were as follows: Maine, 597; New Hampshire, 578; Vermont, 21; Massachusetts, 584; Rhode Island, 22; and Connecticut, 32; total, 1,834. During the latter part of March about 1,300 men from C. C. C. camps were employed on gypsy moth work in sections east of the barrier zone, in New England. The abandonment of a number of C. C. C. camps in New England on April 1 affects the gypsy moth work, east of the barrier zone, to a considerable extent. In Massachusetts the working force will be reduced to 550 men. In Connecticut there will be 370 men available for gypsy moth work. In Vermont there will be a total of 210 men available. In New Hampshire all C. C. C. gypsy moth work will probably be discontinued, as the camps retained are a long way from the area where work had been planned. Under the P. W. A. brown-tail moth project the number of brown-tail moth webs cut up to the last week in March in the three States, namely, Maine, New Hampshire, and Massachusetts, was slightly less than 4,000,000. Of these over 2,250,000 were cut in New Hampshire and about 1,000,000 in Maine. It is interesting to note that many of the brown-tail moth webs cut in Maine were found on some of the islands in Portland Harbor, especially on Peakes Island. In the summer of 1935 a number of families were so annoyed by this insect that they left the island. The infestation, this year, was much greater than last year and, up to the end of March, over 171,000 webs have been cut, with a number more to be cut before the island is completed.

PLANT DISEASE CONTROL

Blister rust control activities in sugar pine region.--During the field season of 1936, approximately 2,250 men will be taken from the relief rolls for blister rust control work in the sugar pine region (California and Oregon). Twenty-three camps will be established in California and seven in Oregon. The supervisors and their assistants have recently made preliminary examinations of camp sites and Ribes-eradication areas, reporting that, although the more remote sites were still under snow, camp-construction work could be undertaken at any time on those lowest in elevation. At middle and low elevations, Ribes are in full leaf and flower, so that eradication conditions are favorable.

Blister rust control work started in Connecticut April 16.--J. E. Riley, State leader of blister rust control work in Connecticut, reported that the buds on cultivated gooseberry plants at New Haven were unfolding on March 28. Currant leaves were evident April 3. The first aecia were found on pine at Greenwich, Conn., on March 28. Our records at the Cambridge office indicate that the earliest date that aecia were ever reported in the region was March 27. During April the weather was abnormally cool and rainy, consequently the development of the vegetation was decidedly retarded; however, it was possible to begin Ribes-eradication work in Connecticut on April 16, in connection with the protection of nurseries that had applied for Federal permit to ship white pines interstate.

Barberry eradication in Indiana.--Wayne E. Leer, in charge of barberry-eradication work in Indiana, submits the following summarized report relating to accomplishments with P. W. A. and W. P. A. funds since August 1933. An intensive survey of 66 areas of escaped bushes in 28 counties has been made with labor employed with emergency funds. These areas comprise approximately 4,000 square miles of territory. The work has resulted in the eradication of approximately 14,000 barberry bushes. Mr. Leer reports that it has been necessary to extend the boundaries of infestation in several counties, and labor crews have been used to scout less intensively much wooded territory immediately adjacent to known areas of infestation, locating many scattered bushes. During the winter of 1935-36 emergency relief funds were used to make a survey of many of the larger cities in northern Indiana, including East Chicago, Whiting, Gary, Hammond, Michigan City, South Bend, and Fort Wayne. More than 5,000 bushes were destroyed on 200 different properties in those cities.

Barberry survey in Ohio.--City surveys were conducted during the months of January, February, and March, crews being located in Cleveland, Akron, Toledo, and their immediate suburbs. These cities cover an area of approximately 200 square miles, with a total population of 1,650,000 people. Harry

Atwood, in charge of barberry-eradication work in Ohio, reports that 31,000 man-hours of relief labor were required to make this survey. In Cleveland 4,250 bushes were removed from 297 properties; in Akron 5,538 bushes were destroyed on 89 properties; and in Toledo, 221 bushes on 66 properties.

COTTON INSECT INVESTIGATIONS

Cotton flea hopper migrations.--A series of flight-screen tests was continued in 1935 by K. P. Ewing and R. L. McGarr at Port Lavaca, Tex., to study the seasonal variation and the relation of wind direction to the migration of the cotton flea hopper. Most of the early infestation on cotton is caused by the migrations from weed host plants. The flight screens used were wooden frames covered with screen wire coated with tanglefoot. The 12 "standard" screens consisted of two 3 by 5 foot panels, with the bottom edge 3 feet from the ground, and placed so that they faced north, south, east, and west. Two towers with screens at elevations up to 24 feet were used to determine the movement at different elevations. Two revolving screens, so arranged that one side always faced the wind, were also used in comparison with the standard screens. The standard screens were erected in cotton fields and in ranch country. Those in cotton fields caught an average of 649 flea hoppers each during the season, as compared to 114 on screens in the ranch country. The percentages of flea hoppers caught on each side of the standard screens during the past 3 years were as follows:

Location	Year		
	1933	1934	1935
North side---	16.7	17.4	13.1
South side---	17.8	21.7	17.5
East side----	30.6	26.1	31.8
West side----	34.8	34.8	37.7

The season's catches at the different elevations on the tower screen were: 3 to 6 feet, 467; 9 to 12 feet, 303; 15 to 18 feet, 225; 21 to 24 feet, 423. Although during the season the total number of flea hoppers collected from the bottom screens on the towers was more than from any other height, during 5 of the 8 months more were collected from the top screens than from the others. More flea hoppers were collected from the east side of the tower screens than from any other direction. The revolving screens, located in the same fields as stationary standard screens, caught 866 flea hoppers during the season, in comparison with 680 on the comparable standard screens. On the revolving screens 449 of the flea hoppers were caught on the leeward and 387 on the windward side. From April 20 to June 30 records were kept of the direction of the wind movement. During these 71 days the prevailing direction of the wind was east, southeast, south, and southwest on 62 days, or 87.3 percent of the time, but only 49.5 percent of the flea hoppers were caught on the panels facing the east and south. During the same period of time the prevailing wind direction was west, northwest, north, and northwest 9 days, or 12.7 percent of the time, while 50.5 percent of the flea hoppers were caught on the panels facing west and north. These records show that the greatest catch was on the panels opposite to or at an angle to the prevailing wind. This was also true on the revolving screens, where the greatest number were caught on the leeward side. All of the flea hoppers caught on the screens were adults. The abundance in the air as shown by the screen catch, and the migration to the cotton fields was checked by examination of the cotton plants. During the last week of April there was a fairly large increase in the screen catch but field examinations showed the flea hoppers were not stopping on the cotton. The distinct, heavy migration from weeds to cotton occurred during the first week of June in 1935, which was nearly a month later than in 1934. During the last week of May an average of 10.1 flea hoppers were caught by the screens, and during the following week the catch increased to 60.4 per screen. Field inspections showed an increase during this period from 17.6 to 45.5 flea hoppers per 100 cotton plants. Examination of horse mint, a very abundant early host plant, showed that the population was rapidly decreasing on these plants during the time of the heavy migration and increase on cotton.

Emergence of cotton flea hopper.--Emergence of cotton flea nymphs from overwintering eggs in weeds collected last fall and caged this spring began on March 6, according to Messrs. Ewing and McGarr. The weather was very dry and very little emergence occurred in March and the first half of April. On April 17 there was 1.26 inches of rain and emergence increased, reaching a peak on April 28, with a total of 7,095 nymphs. The peak last year was on April 6. The emergence from a comparable number of cages during April in 1934 was 22,877 nymphs; in 1935, 38,595 nymphs; in 1936, 29,133 nymphs.

Oviposition of bollworm moths.--R. W. Moreland, College Station, Tex., reports that during April five species of plants were examined for eggs of *Heliothis obsoleta* Fab., with results as follows: Alfalfa, 4,800 plants and 58 eggs; bluebonnets (*Lupinus subcarnosus*), 1,280 plants and 30 eggs; and bluebonnets (*L. texensis*), 1,200 plants; corn, 500 plants; and false indigo, 200 plants without any bollworm eggs being found. Mr. Moreland also states that Dr. R. K. Fletcher, of the Texas Agricultural Experiment Station, reports that no bollworm moths emerged from hibernation cages at College Station in April.

Varietal variation in boll weevil damage.--In order to study the effect of boll weevil damage on varieties of cotton producing bolls with thin and thick walls, six varieties of each type were grown at Stoneville, Miss., during the season of 1935 by E. W. Dunnam. Noninfested bolls of known ages of each variety were enclosed for 24 hours in muslin bags, with ten pairs of sexually mature weevils. The weevils were removed and a small paper bag was then tied over each boll to prevent further injury by insects. Bagging began on July 23 and continued daily until August 26, thus providing a sample of about 300 bolls for each variety. When the mature bolls were examined, the average percentage of cotton destroyed and damaged was found to be 34.48 percent and 7.65 percent for the thin-wall group, and 32.63 percent and 6.36 percent for the thick-wall group, respectively. Practically all the bolls up to 4 or 5 days old were destroyed and there was also a high percentage of loss in each variety when exposed to weevils before the carpel lining hardened at about 15 days of age for the thin-hulled group and slightly longer for the thick-hulled group. The maximum ages at which bolls were damaged and destroyed were 37 days each for the thin-hull varieties and 40 and 39 days, respectively, for the thick-hull varieties. The undamaged and weevil-injured locks from the bagged bolls of each variety were ginned separately and then classed by the Bureau of Agricultural Economics. All samples of nondamaged cotton of both groups were classed as three grades above middling. The corresponding damaged samples were all classed one grade below middling.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Wild cotton eradication.--Excellent progress was made with the eradication of wild cotton in southern Florida during April. This was due to ideal weather conditions. A first clean-up of new colonies was made on 3,364½ acres, from which 38,365 mature and 27,830 seedling plants were removed. A recleaning was made on 6,905-3/4 acres, from which 5,587 mature, 158,915 seedling, and 11,946 sprout plants were removed. With one or two exceptions all of the areas cleaned during previous seasons had been recleaned by the end of the month. Work this season is being carried on with W. P. A. funds and, as larger crews are being used, the men supervising the work have very little time for inspection to determine the present status of infestation. Therefore, as the cotton is eradicated green bolls are collected, placed in a solution of copper sulphate, and sent to the San Antonio laboratory for inspection. Thus far, approximately 3,000 bolls have been inspected and 36 pink bollworms found. All of the specimens were from bolls collected on Key Largo. These inspections cover 11 different localities in five counties of southern Florida.

Thurberia-plant eradication.--The eradication of Thurberia plants in the Santa Catalina Mountains of southern Arizona has continued to make satisfactory progress. The latter part of the month numerous plants were encountered. As an example, 43,750 were removed on April 23 and 64,382 on April 28. In some places the plants were so thick that at least a half dozen could be pulled at one time with very little effort, as they were close together and practically unbranched. In other cases, where the plants were more scattered, they were well developed and heavily fruited. They ranged in size from 6 inches to 12 and 14 feet. Many of the plants were infested with the Thurberia weevil, and it is to remove this menace from cultivated cotton that the work is being carried on. During the month 8,260 acres were covered and 353,013 Thurberia plants destroyed with W. P. A. funds.

Trap-plot cotton in the Big Bend.--Due to adverse weather conditions, the trap-plot cotton in the Big Bend area of Texas has been retarded. Conditions have been more favorablo the latter half of the month and the cotton is beginning to grow, but not as fast as usual. The trap cotton is one of the control measures used in the Big Bend, the others being field clean-up in the fall and delayed planting of the crop the following spring, so that the majority of moths will emerge before cotton reaches the fruiting stage. This season only one farmer in the Big Bend failed to observe the delayed-planting date of April 15.

Laboratory inspection.--The inspection of green bolls and bollies collected from the 1935 cotton crop is going forward satisfactorily at San Antonio and a number of field stations. None of the material collected outside regulated areas has been found infested. Infestation has been found in material collected within regulated areas from Dona Ana County, N. Mex., and Hudspeth and Presidio Counties, in Texas.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Effectiveness of hydrocyanic-acid gas fumigation against larvae of rhododendron whitefly.--Randall Latta, of the Sumner, Wash., laboratory, in cooperation with A. G. Webb, of the Division of Foreign Plant Quarantines, conducted vacuum fumigation tests early in January against larvae of Dialeurodes chittendeni Laing, on two balled rhododendron plants from a nursery. One of these plants was treated at a dosage of 1/2 ounce of sodium cyanide for a 1-hour period and the other at a dosage of 1 ounce for 1 hour. The gas was introduced into a 15-inch vacuum, which, after 15 minutes, was reduced to 4 inches for the duration of the exposure. The plants were replanted, and subsequent checks showed that none of the larvae survived either fumigation. As a final check, an examination on April 30 disclosed that, although larvae from untreated plants of the same variety had nearly all advanced to the pupal stage, no larvae or pupae were found on the treated plants.

Bees disseminate azalea flower spot disease.--As a result of observations conducted at Charleston, S. C., on insect vectors of the azalea flower spot disease, Floyd F. Smith, of the Beltsville, Md., laboratory, reports that data obtained this year show definitely that bees can disseminate the organism causing this disease. The 1936 observations also demonstrated that favorable conditions of moisture and absence of free-air circulation must prevail for the disease to become serious. These findings corroborate the tentative conclusions reached during investigations performed in 1934 and 1935. A total of 587 tests were made at Charleston with various species of bees, thrips, flies, and beetles. The results indicated that a very small percentage of the insects involved induced infection of the azalea flower spot at the beginning of the season. As the disease became more general on the azaleas, however, an increased percentage caused infection. At the end of the flowering season when the disease was less prevalent on the late flowering varieties, there was a decline in the percentage of the resident insect population that caused infection.

Differences in performance of diluents used with pyrethrum against celery leaf tier.--As a result of recent laboratory tests wherein finely ground clay, tobacco, sulphur, fuller's earth, talc, and a commercial product known as "Celomite" were used as diluents for pyrethrum, applied against quarter-grown and half-grown larvae, respectively, of Phlyctaenia rubigalis Guen., C. B. Wisecup, of the Sanford, Fla., laboratory, reports that no significant differences were shown in the mortality obtained with the dust mixtures containing sulphur, fuller's earth, Celomite, or talc, against larvae of either size, but that the dust mixtures containing clay and tobacco as diluents gave a significantly lower percentage of larval mortality. The diluents alone without the addition of pyrethrum, gave a negligible mortality of the leaf tier larvae, indicating that there was not a measurable difference between the performance of the diluents alone.

The reason for the comparatively low mortalities obtained with the pyrethrum-clay and pyrethrum-tobacco dust mixtures has not been determined, although it is suspected that the differences in the performance of the dust mixtures containing these two diluents, as compared to the dust mixtures containing sulphur, fuller's earth, Celomite, or talc, are mechanical in character, as well as possibly attributable to the arbitrary limits of experimentation set up for this laboratory problem. Further experiments are under way in an attempt to explain more definitely the reason for this extreme variation in the performance of materials commonly or widely used as diluents against the celery leaf tier.

Beet leafhopper survives winter in Montana.--J. R. Douglass and D. E. Fox, of the Twin Falls, Idaho, laboratory, report that surveys in the Billings, Mont., beet-growing district from April 20 to April 23, revealed that a small number of females of Eutettix tenellus Bak. had survived the winter of 1935-36 in that district, and that some of the host plants of E. tenellus had germinated the previous fall. The surviving adults were found near Billings and Warden, practically in the center of the district where the curly-top disease of sugar beets was most prevalent during the 1934 and 1935 seasons. The determination of the fact that even a very few E. tenellus individuals can survive winter conditions in the Billings district is of great importance, as it demonstrates the ability of this pest to survive a moderately severe Montana winter and shows at least a temporary extension of this insect's normal range.

Ability of pea weevil to survive low temperatures without natural protection.--In reporting on the winter mortality of the pea weevil in Idaho during the winter of 1935-36, T. A. Brindley, of the Moscow, Idaho, laboratory, says that of the weevils from cages placed in 22 localities, representing widely divergent conditions in the State, 2.06 percent survived a minimum temperature of -18° F. and that none survived minimum temperatures ranging from -19° to -34°. The weevils used in these experiments were placed in specially constructed cages, where they remained dry but were exposed to all fluctuations in temperature. It should be emphasized, therefore, that the information on mortality obtained in these tests does not necessarily reflect the mortality that would obtain in the field, where the hibernating insects often receive the benefit of protection from the elements by being covered with snow and various types of plant shelter.

INSECTS AFFECTING MAN AND ANIMALS

Specificity of parasitization of two species of parasitic blowflies.--Experiments conducted by E. F. Knipling, of the Valdosta, Ga., laboratory, have shown that larvae of the primary screw worm fly (Cochliomyia americana Cushing & Patton), parasitic on warm-blooded animals, will not develop in cold-blooded animals, such as snakes, turtles, alligators, and others, whereas the larvae of Sarcophaga cistudinis Ald., parasitic on turtles, will not develop in warm-blooded animals, such as sheep and goats.

Species of dipterous larvae collected from cases of myiasis in man and animals in the United States.--Determination by E. F. Knipling of the species of flies of 880 lots of larvae collected from cases of myiasis in man and animals in the United States during 1935 and up to April 1, 1936, by members of the Screw Worm Control Division and others, show that in 87.1 percent of these cases the primary screw worm fly (*C. americana*) was taken in pure culture and in 2.6 percent of these cases this species was taken in association with secondary invaders. In 10.3 percent of the cases only the secondary species were involved. The secondary species involved include *Phormia regina* Meig., *Lucilia* sp., *Cochliomyia macellaria* Fab., *Sarcophaga* sp., *Calliphora* sp., *Musca domestica* L., *Cynomyia cadaverina* Desv., *Stomoxys calcitrans* L., *Hermecia* sp., and in two cases it was impossible to identify the larvae. Of the so-called secondary species, *P. regina* was more often implicated in myiasis than the others. *Lucilia* sp. as a group ranked second in number of cases in which the various species were involved. Species of *Lucilia* taken from wounds were *L. sericata* Meig., *L. caeruleiviridis* Macquart, and *L. cluvia* Walker. *C. macellaria* ranked third in number of cases in which this species was taken. *Sarcophaga* species as a group was fourth. Specimens were examined from a total of fifteen cases of myiasis in man. The species and number of cases in man in which each was involved were as follows: *C. americana*, 7; *L. sericata*, 2; *Sarcophaga bullata* Park., 2; *Phormia* sp., 1; *C. cadaverina*, 1; *M. domestica*, 1; and undetermined species, 1.

Notes on the biology of the Gulf coast tick.--Observations made by Homer Hixson, Valdosta, Ga., on the life history of *Amblyomma maculatum* Koch show that the unfed larvae are able to survive for approximately 4 months under natural conditions and approximately 5-1/2 months in the laboratory. The eastern meadow lark is an important host of the immature stages of this tick, and examination of a number of these birds showed that no larvae were present on them after February 26, although 79 percent of the birds examined in April were infested with nymphs. The first activity of the adult tick was noted on April 17. These observations were made in Georgia and Florida.

Resistance of pupae of the primary screw worm fly to low temperature.--Experiments conducted by C. N. Smith at Washington, D. C., show that 82.5 percent of the pupae of *Cochliomyia americana* were able to resist a temperature of 14° F. for 48 hours when buried in dry sand, and 70 percent survived the same temperature when exposed for the same length of time buried in wet sand.

Electric fly traps caught fewer blowflies than Government cone-type trap.--Preliminary experiments conducted by O. G. Babcock, at Sonora, Tex., to determine the relative efficiency of an electric screen-type trap as compared to the standard Government cone-type trap, show that during a period of 10 days the electric trap caught a total of 16.6 quarts of blowflies, as compared with 20.5 quarts for the Government cone-type trap.

SCREW WORM CONTROL

Early cases of screw worms.--W. E. Dove reports that throughout the winter months screw worms were present in wounds of animals in Florida and in the southern portion of Texas. During January, February, and March, 4,598 cases of screw worms were reported from the peninsula portion of Florida and there was some activity in the more northern counties. During the week ending April 11, 638 cases were reported from the State, of which 408, or 63.95 percent, occurred in navels of newly born animals. For the week ending

April 18 there were 1,392 cases, of which 1,070, or 76.87 percent, occurred in the navels of young animals. During April cases were reported from Florida as far north as the Georgia boundary line, including Nassau County on the East and Escambia County on the West. The occurrence of small numbers of screw worm cases in the southern portion of Texas and comparable numbers in the lower portion of the goat and sheep area shows that there is a gradual building up of a screw worm population which extends over most of the counties south of Edwards Plateau. During January and February screw worm cases were present in Brooks County, in Falfurrias County during the first week of March, and in Kleburg County on March 15 and also during a warm period on April 9. Brazoria, Matagorda, Jackson, and Calhoun Counties reported no screw worms in dehorned animals and wounds. Stockmen report that cases normally appear in these counties about May 1. On April 10 and 13 screw worms were observed in navels of young animals and in brand wounds in Jim Wells County. On one ranch 10 cases were found in 1,000 cattle. On April 16, screw worm cases were becoming numerous in the northeastern part of Bee County. In the southern counties of Texas there is a tendency among ranchmen to overlook or neglect treatment of early cases. They know that animals infested early seldom become reinfested and that such animals usually get well without treatment. This neglect of early cases permits an increase of screw worm flies during the early part of the season and suggests a very definite procedure in control of the pest. In South Carolina, Mississippi, Louisiana, and Alabama considerable scouting is being done, but only one case of true screw worms was reported. This occurred at Clayton, in Barbour County, on April 24. In the Southeastern States pine tar oil is being supplied to county agents so that it can be demonstrated for prevention of screw worm infestations.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Forty-six living larvae and seven living pupae of the Mediterranean fruit fly (*Ceratitis capitata* Wied.) were intercepted at New York on January 4 in four grapefruit in stores from Sicily. A living specimen of the lygaeid *Geocoris thoracicus* Fieb. was found at El Paso, Tex., on February 3 on a chili pepper in cargo from Oaxaca, Mexico. Nine living larvae of *Pyrrhidium sanguineum* L. were taken at New Orleans on January 2 in an oak log in cargo from England via the Netherlands. This cerambycid is found in oak in Europe. The scale insect *Leucaspis cockerelli* (de Charm.) was intercepted at Philadelphia on October 28, 1935, on the leaf and stem of a palm (*Kentia* sp.) plant in ship's furnishings from Brazil. A living specimen of the fulgorid *Cenchrea brunnea* Mc.A. was found at Gulfport, Miss., on January 28 on a banana in cargo from Mexico. A living specimen of the coccid *Ceroputo barberi* (Ckll.) was intercepted at San Juan, P. R., on December 2, 1935, on a plant *Cestrum hortulanum* in baggage from St. Thomas, American Virgin Islands. A living adult of the chrysomelid *Ctenochira punicea* Boh. was taken at Brownsville, Tex., on February 11 on a gardenia in cargo from Mexico. A living larva of *Platynota rostrana* Walk. was found at New Orleans on February 18 in a pepper pod in cargo from Cuba. This tortricid is recorded from Florida and Texas. Living larvae and pupae of the agromyzid *Napomyza lateralis* Fallen were intercepted at New York on March 27 and 30 in endive leaves in cargo from Belgium. A living adult of the chrysomelid *Diabrotica theimei* Baly was found at Nogales, Ariz., on January 9 on a bell pepper in cargo from Sinaloa, Mexico. Dead adults of the bruchid *Acanthoscelides spinipes* Er. were taken at Washington, D. C., on December 12, 1935, in and with legume seed in the mail from Greece. The cattleya fly (*Eurytoma orchidearum* Westw.) was intercepted at San Francisco on January 20 on an orchid (*Cattleya mossiae*) in cargo from Venezuela. This eurytomid was presumably introduced into greenhouses of the United States from Colombia about 1890.

Pathological interceptions of interest.--A *Galanthus* bulb from Holland intercepted at Philadelphia on September 23, 1935, was infected with *Ascochyta* sp. Apparently no species of *Ascochyta* has previously been reported on *Galanthus*. *Aspergillus* sp. intercepted at Mobile on August 23, 1935, on garlic bulbs from France, resembled *A. alliaceus* Thom and Church in general appearance of sclerotia and conidia, but the heads were abundant instead of scattering, as in the named species. *Diplocarpon rosae* Wolf was intercepted from the Dominican Republic for the first time on April 22 at San Juan. Our first interception of *Exoascus betulinus* (Rostr.) Sadeb. witches' broom of birch was made at New York on March 19 in a bundle of cuttings in baggage from Germany. *Gloeosporium taxicolum* Allesch was intercepted for the first time on October 27, 1935, at New York in yew cuttings from Ireland. *Leptosphaeria culmicola* (Fr.) Karst. was intercepted for the first time on January 14 at New York in wheat straw from France. *Leptosphaeria* sp. intercepted at New York on November 11, 1935, in rice straw and hulls from Puerto Rico does not agree with described species on the host. *Marsonia* sp. on grape leaf from England found in stores on October 15, 1935, at New York does not agree with species reported for the host. Our first interception of *Metasphaeria cocoes* Petch was made at New York on September 23, 1935, on coconut from the Dominican Republic. *Phoma betae* (Oud.) Frank on beet was intercepted from Sweden for the first time on April 16 at Norfolk. *Phomopsis cocoes* Petch on coconut was intercepted from Puerto Rico for the first time on September 23, 1935, at New York. Our first interception of *Phyllosticta nigromaculans* Sacc. was made on September 19, 1935, at Washington. *Phyllosticta* sp., perhaps *P. sophorae* Ell. & Ev., was intercepted at Hidalgo on March 5 on *Sophora secundiflora* from Mexico. *Phyllosticta* sp., perhaps a new species, was intercepted on *Stapelia cooperi* from South Africa on April 24 at San Francisco. Our first interception of *Puccinia lippiae* Speg. was made at Roma on April 10, the host being *Lippia wrightii* from Mexico. *Rhabdospora* sp. was intercepted on peony for the first time on October 31, 1935, at Seattle on nursery stock from Japan. An undetermined species of *Sclerotium* was intercepted on September 18, 1935, at New York on *Galanthus* bulbs from Turkey. *Stilbum incarnatum* Wakker was intercepted on *Pachyrhizus erosus* for the first time on September 26, 1935, at San Francisco in cargo from China. *Ustilago caricis* (Pers.) Unger was intercepted for the first time on April 11 at Seattle in carex seed from Norway. *Vermicularia* sp. was intercepted on iris for the first time on March 25 at Seattle on *Iris rosea* from Japan.

DOMESTIC PLANT QUARANTINES

Citrus canker inspection increased.--The inspection carried on regularly in cooperation with State inspectors for citrus canker is now being concentrated on an intensive search for the disease in the entire area throughout the Gulf coast region from Houston, Tex., south to the Rio Grande. Trained inspectors transferred from the date scale project, now approaching completion, have also recently been assigned to the work. The search for citrus canker in the Houston-Galveston-Beaumont area of Texas since the first of the year has included the reinspection of three counties found infected in 1935, and the inspection of seven other counties in the vicinity. No canker has been found thus far outside those counties known to be infected in 1935, and of the five properties where canker has been found in 1936, one in Galveston County and one in Jefferson County were known to be infected in 1935. Two other infected properties have been found thus far in Galveston County, and one in Harris County.

White pine nursery inspection in progress.--It is expected that the inspection of the sanitation zones surrounding the five-leafed pine nurseries whose owners have applied for shipping permits for the coming fiscal year will be completed by the close of May in New England, the Appalachian area, and the Middle West. Similar work is under way in Oregon, Washington, and Montana. The search for currant or gooseberry plants is being accomplished early in the spring when these plants are easily detected because of their habit of leafing out earlier than most other vegetation. Nurserymen state that there is an inadequate supply of both white pine planting stock and white pine seed. This insufficiency is reported to be the result of the increased interest in planting and of the use of such stock in reclaiming waste lands and denuded areas, as well as for preventing soil erosion.

S. C. S. applies blister rust sanitation measures in 13 nurseries.--Applications for pine-shipping permits under the provisions of the white pine blister rust quarantine have been received from the Soil Conservation Service for 2 nurseries in Pennsylvania, 3 in New York, 1 each in Virginia, Ohio, Iowa, Minnesota, Wisconsin, and Oregon, and 2 in Washington. In addition, the S. C. S. is establishing Ribes-free zones around several nurseries in noninfected States.

Activities on phony peach disease control outlined.--A plan of operation under which phony peach disease control work will be furthered in the 1936 field season has been discussed with quarantine officials of the infected States and an outline has been drawn up for the use of each of the State leaders, analyzing the conditions in each State and detailing the type of work to be done in given areas. These types of work include inspection of commercial orchards, home orchards, and nursery environs, establishment of eradication areas, and a survey of the counties bordering on the known infected areas to determine whether the disease is spreading.

Country-wide plant shipments intercepted.--Shipments in violation of Federal domestic plant quarantines were consigned to every State in the Union except Delaware, Louisiana, and New Mexico in March or April, as shown by reports of transit inspectors. Of the 629 shipments intercepted by transit inspectors at terminal railway points and turned back to senders in these 2 months, 99 had been consigned to New York, 51 to Ohio, 48 to Pennsylvania, 47 to Illinois, 30 to Michigan, 26 to Nebraska, 25 to California, 22 to Florida, 21 to Minnesota, 21 to Virginia, and 10 or more each to Connecticut, Idaho, Indiana, Maine, Missouri, New Jersey, Oregon, Vermont, and Wisconsin. California State inspectors also reported the interception of 5 such violations in this period.

Work resumed on peach mosaic project.--Field work on the relief project relating to the peach mosaic disease in Colorado, temporarily suspended last fall because of weather conditions, was resumed on April 20. Five crews on survey work in Mesa County located nearly 7,000 infected peach trees in 10 days. Laborers accompanying the crews cut the infected trees as fast as they were located, and other crews following later burned the stumps. A cooperative survey for the peach mosaic disease is under way in Texas and is being extended to other States, including the inspection of places in Kansas and Iowa to which budded wood was shipped from the infected area in Colorado a few years ago.

States issue quarantines on peach mosaic disease.--Under quarantines recently issued by these States, peach nursery stock may not be shipped to California, Colorado, or Oregon from counties infected with the peach mosaic disease.

INSECTICIDE INVESTIGATIONS

New apparatus for measuring particle size of insecticidal dusts.--L. D. Goodhue and C. M. Smith, Washington, D. C., have designed and constructed a new apparatus for the determination of the rate of settling of the particles of a powder in a liquid medium, from which the relative amounts of particles of various sizes can be deduced. The apparatus is in effect a differential manometer that measures the change in density of the suspension as the particles settle out. The differential effect is obtained by working in a two-tube closed liquid system, consisting of two immiscible liquids differing slightly in specific gravity, the lower of which serves as the suspending medium for the powder. Studies of calcium arsenate and paris green are under way.

Method for estimating nicotine concentrations during fumigation.--There has been need of a method of determining nicotine in the atmosphere of fumigating chambers. To this end the silicotungstic acid method for the determination of nicotine has been adapted to a micro scale by J. R. Spies. Because of the small quantities of nicotine that may have to be determined, it was necessary to determine the solubility of nicotine silicotungstate in dilute HCl and to study the optimum conditions for precipitation. Pure nicotine silicotungstate was prepared and its solubility in dilute HCl from a pH of 1 to 6.6 was determined. Starting at 0.1 N, the solubility drops on to a smooth curve to 0.03 N; here a sharp break is found between 0.03 and 0.02 N, and then a gradual decrease to 0.001 N. In water (pH 6.6) the solubility was greatest, being approximately 0.0368 mg/ml; at 0.001 N the solubility was 0.0051 mg/ml. The results obtained are to be incorporated in a paper for publication. The experiments made to date indicate that as little as 0.05 mg nicotine in 10 ml of dilute hydrochloric acid can be determined with an error not much greater than 1 percent. Apparatus has been designed and constructed for studying the absorption of nicotine from the air. In trial experiments it has been found that complete absorption of nicotine can be effected in 1.5 ml of 1 N HCl in one absorber with gas velocities as high as 500 ml/minute. Several analyses of actual fumigation have been run, and only about one-tenth the expected nicotine found; laboratory experiments are now under way to determine the probable cause of the low results.

Liquid hydrocyanic acid may contain sulphur dioxide.--L. B. Howard, during the course of a field fumigation of citrus near Whittier, Calif., detected the presence of sulphur dioxide in the fumigating gas. It was subsequently ascertained that one of the two producers of liquid hydrogen cyanide in this region employs sulphur dioxide as a stabilizer. Considering the destructive action of sulphur dioxide on foliage in general, it was thought desirable to determine the amounts present in the cyanide at different times, that is, when different shipments of the liquid were employed. In a series of ten determinations, it was found that the quantity of sulphur dioxide in different batches of the liquid ranged from 5.6 to 16.0 percent by weight. It is not improbable that occasionally the concentration of sulphur dioxide might reach a value definitely harmful to the citrus tree.

BEE CULTURE

The place of pollen reserves in early package colony development.--C. L. Farrar, of the Intermountain Bee Culture Field Laboratory, Laramie, Wyo., reports as follows: "The results of experiments with pollen reserves on the surviving population of overwintered colonies suggest a need for data on pollen reserves for starting packages with two possible applications: First, it is possible that colonies lacking in sufficient pollen reserves in the fall for successful wintering may be economically destroyed in the fall and replaced with packages sufficiently early to utilize what reserve pollen was present in the combs of the destroyed colonies; or, second, to lend greater emphasis to timing properly the establishment of packages with the pollen supply instead of depending on a particular date which may be right one season but improper at another."

Food of mature and immature worker bees and queens.--Another phase of research directed toward the solution of the supersedure problem is the physiological work on the food of mature and immature worker bees and queens. This work is under the direction of R. M. Melampy, assistant apiculturist at the Southern States Bee Culture Field Laboratory, Baton Rouge, La. This work is gradually getting under way and will be closely correlated with the queen-yard work of E. Oertel and the genetics work of Otto Mackensen at the same laboratory.

Relation of nutrition to dimorphism of female bees.--Mr. Melampy also states: "It has been reported that 'royal jelly' contains vitamin E, which is responsible for the differences existing between the worker and queen bees. This is to be reinvestigated by feeding 'royal jelly' to rats. The lack of vitamin E causes a permanent sterility in rats and in the female the condition is temporary. Female sterility can be cured with extremely small quantities of vitamin E."

IDENTIFICATION AND CLASSIFICATION OF INSECTS

A cactus-feeding beetle from Texas.--W. S. Fisher has identified as Parmenosoma griseum Schaeff. five specimens of a cerambycid submitted for determination by the Division of Insects Affecting Man and Animals. They had been taken at Cotulla, Tex., on April 24 by Gradin Barnett, and were said to be a cactus-feeding species. Nothing was previously known concerning the habits of this form, which up to this time has been represented in the collections of the National Museum only by the holotype specimen.

New records from nests of the cut ant.--The Division of Cereal and Forage Insect Investigations has submitted for identification certain insect material collected by E. V. Walter in nests of the cut ant Atta texana Buckley at San Antonio, Tex. Among this material is a series of 15 specimens identified by Alan Stone as a new species of Phlebotomus belonging to the subgenus Neophlebotomus. This is the first record of a species of this subgenus from the United States. Only two species of Phlebotomus have been known to occur in this country, both belonging in the subgenus Brumptomyia. The specimens of the new species were found in the nest to a depth of 8 feet, and, according to Mr. Stone, it is not improbable that they were breeding in this situation. It would be of interest and importance to know the hosts of this species. One female and two male moths, also contained in this material from nests of the cut ant, have been determined by August Busck as Amydria confusella Dietz, a species of Tineidae. There have been no previous observations on the behavior of species belonging to this genus. The presumption that the species is a true myrmecophile, and possibly even myrmecophagous, is warranted, in view of the relationship of Amydria to certain other myrmecophilous genera in the family. However, this remains to be demonstrated by actual observation of the immature stages.

An egg parasite of the black widow spider.--Recently there was received for identification from the Division of Cereal and Forage Insect Investigations a series of specimens reared from eggs of the black widow spider at Wichita, Kans., by H. H. Walkden. Shortly after this, several additional specimens of the same species, also reared from the eggs of that spider, were submitted by W. J. Baerg, of the University of Arkansas. C. F. W. Muesebeck has identified the parasite as a new species of Baeus, a genus of Scelionidae the species of which appear to be exclusively parasitic on spider eggs. This appears to be the first record of an egg parasite of the black widow.

Additional North American record for a European leafhopper.--Doratura stylata Boheman, a European leafhopper, was first recorded from North America in 1924 (Psyche 31:170), when G. W. Barber reported the capture of three specimens in Massachusetts. Additional specimens identified as this species by P. W. Oman were recently received for determination from R. H. Beamer, of the University of Kansas, and were collected by M. W. Sanderson at Plymouth, Mass., and Jerome, Mich. There is no evidence to indicate whether the Michigan record represents a normal spread of the species or whether it was introduced there. D. stylata, like the species of the American genus Athysanella which it resembles, is a grass feeder so far as is known.

UNIVERSITY OF FLORIDA
3 1262 09315 2584